

REMARKS

A. Request for Reconsideration

Applicants have carefully considered the matters raised by the Examiner in the outstanding Office Action but remain of the position that patentable subject matter is present. Applicants respectfully request reconsideration of the Examiner's position based on the amendments to the specification, the amendments to the claims and the following remarks.

B. The Invention

The claimed Invention is a display substrate that has three layers:

- (1) a transparent film;
- (2) a moisture proof film formed on a surface of the transparent film; and
- (3) a transparent conductive film formed on moisture proof film or on the surface of the transparent film opposite to the surface where the moisture proof film is formed.

One of the unique aspects of the present Invention is the transparent film used to make up the display substrate. Display substrates used in Liquid Crystal displays are often subject to

high temperature, page 2, lines 5 and 10, of the Application, and many plastic substrates crack under thermal treatments, page 3, line 9. Cellulose esters have the disadvantage of having a high moisture absorbing property, which is typically controlled with the addition of 5-20 wt. % of plasticizer. Plasticizer, however, can have deleterious effects, page 5, line 3, of the Application.

Applicants have discovered that a cellulose ester film can be used as the transparent film in the display substrates if the amount of plasticizer is kept below 1 wt. % and the film is subject to biaxial stretch, page 5, lines 5-11. In fact, one of the unique aspects of the present Invention is that the display substrate maintains a low moisture permeability after thermal shock, heat treatment. This aspect of the present Invention is shown in the data in Tables 1 and 2 on page 104 and 110 of the Application, and is further evidence by the Declaration of Yasushi Okubo Under 37 CFR 1.132, enclosed herewith.

C. Claim Status

Claims 12-17 and 22-31 are presented for further prosecution. No claims are amended.

D. Prior Art Rejection

The rejections were maintained from the previous Office Action, dated July 24, 2010, as follows.

- (1) Claims 12-17, 22-23, 25-29 and 31 had been rejected as being unpatentable over Yamada (US 2002/0123209) in view of Machell (US 5,219,510) as evidenced by Sobrinho;
- (2) Claim 24 is rejected as being unpatentable over Yamada in view of Machell as evidenced by Sobrinho, and further in view of Kakinuma (US 5,840,465); and
- (3) Claim 30 is rejected as being unpatentable over Yamada in view of Machell as evidenced by Sobrinho, and further in view of Ota (US 6,866,949).

The Examiner has reiterated the position taken in the Office Action dated July 24, 2009, arguing that although none of the cited references teach that improved moisture barrier properties are maintained after thermal shock, this property is *prima facie* inherent in the substrate of Yamada, as modified by Machell and as evidenced by Sobrinho. The Examiner also stated that Applicants have not provided comparative data showing that

the display substrate of Yamada, as modified by Machell, and evidenced by Sobrinho, does not maintain low moisture permeability after thermal shock (Office Action, text bridging pp 3-4).

In order to respond to the Examiner's comments that no comparative data has been presented, tests have been run and are presented herein by way of a Declaration of Yasushi Okubo Under 37 CFR 1.132 ("the Declaration"). The Declaration provides additional evidence in the form of comparative testing, relative to the closest prior art.

The comparative testing was carried out based on Film Substrate 25 in Example 4 of Yamada [0110], which is a preferred embodiment of Yamada. This film is labeled C in the Declaration. Film Substrate 25 of Yamada does not have a moisture proof film nor a transparent conductive film, and therefore Film Substrate 25 was provided with a moisture proof film and a transparent conductive film, to provide the closest prior art to be compared with the invention [Declaration, pp 2-3, ¶2].

Comparative substrates for testing are designated as C-1, C-2 and C-3, respectively, and the substrates according to the invention for testing are designated as I-1, I-2 and I-3, respectively. The Comparative Substrates were prepared as detailed by the Declaration from page 3, first full paragraph, through page 4, first full paragraph. The Inventive Substrates were prepared as detailed by the Declaration, at page 4, second through fifth full paragraph.

As described in the Declaration, Film C-1 was drawn laterally by a factor of 1.06; Film C-2 was drawn laterally by a factor of 1.35; and Film C-3 was drawn laterally by a factor of 2.00. Films I-1, I-2, and I-3 were also drawn by a factor of 1.06, 1.35 and 2.00, respectively, but I-1, I-2, and I-3 were drawn in both directions, laterally and in the conveying direction.

As is apparent from Table 3, at page 5 of the Declaration, the Inventive Substrates I-1 through I-3 and Comparative Substrates C-1 through C-3 are extremely low in moisture permeability, as compared with Comparative Substrate C, Film Substrate 25 of Yamada. The moisture permeability of C-1, C-2 and C-3 uniformly clearly increases by more than five-fold after thermal shock. The moisture permeability of I-1, I-2 and I-3

uniformly increases by somewhat less than two-fold after thermal shock.

The moisture permeability (before thermal shock) of inventive Substrates I-1 through 1-3 is substantially the same as that of comparative Substrates C-1 through C-3, however, moisture permeability after thermal shock of inventive Substrates I-1 through 1-3 are about three times lower than that of comparative Substrates C-1 through C-3, the inventive Substrates I-1 through I-3 greatly improving moisture permeability after thermal shock.

These results are unexpected to one of ordinary skill in the art.

Further, the evidence provided by Sobrinho is urged to be negated, because there is no evidence of record that the artisan would have expected the surface smoothness provided by biaxial stretching to have any effect on the parameter of moisture permeability after thermal shock.

The data confirm that the invention as claimed provides clearly unexpected advantages relative to the substrate of Yamada. Given the demonstrated difference in performance

between Comparative and Inventive films, the ordinary artisan would not have thought to combine the teachings of Yamada, with the biaxial stretching taught by Machell, in the film of claim 12, having less than 1% plasticizer, with all the advantages now shown to be provided by the film of claim 12.

In addition, Applicants submit that it would not have been obvious to one of ordinary skill in the art at the time of the invention to combine Yamada with Machell because of the difference in the numerical stretching parameters. Yamada discloses a display substrate having stretch of 1.06 in one direction, but fails to teach biaxial stretch of the cellulose ester film. In contrast, Machell discloses the cellulose ester film biaxially stretched by a stretch ratio in the range of 25 through 125 percent, and preferably 50 through 100 percent in both directions (in both the lateral direction and the conveyance direction, column 10, lines 5-17). [Declaration, page 2, ¶1]. Given this clear non-overlapping difference in the stretch parameters between the respective references, it is urged that Machell would not have been used by the artisan to correct the deficiencies of Yamada. For this reason, it is respectfully submitted that the alleged *prima facie* rejection cannot be maintained.

Applicants also point out that the combined references of Yamada and Machell do not result in the three layered display substrate in the claims. It is submitted that one of skill in the art is not lead to a display substrate with the three layers of a transparent film, a moisture proof film and a transparent conductive film.

The Examiner has also maintained the previous rejection of claim 24 over Yamada in view of Machell as evidenced by Sobrinho, and further in view of Kakinuma. Claim 24 depends from claim 12, and it is submitted that Claim 24 is patentable in view of the cited art, for all of the reasons given above.

The Examiner has also maintained the previous rejection of claim 30 over Yamada in view of Machell as evidenced by Sobrinho, and further in view of Ota (US 6,866,949). Claim 30 depends from claim 12, thus, it is submitted that Claim 30 is patentable in view of the cited art, for all of the reasons given above.

Respectfully, the claims are patentable over the references taken alone or in combination.

E. Conclusion

In view of the foregoing and the enclosed, it is respectfully submitted that the application is in condition for allowance and such action is respectfully requested.

Should any fees or extensions of time be necessary in order to maintain this Application in pending condition, appropriate requests are hereby made and authorization is given to debit Account No. 02-2275.

Respectfully submitted,

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Enclosure: Executed Declaration of Mr. Yasushi OKUBO
signed on March 17, 2010.